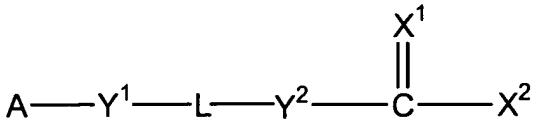
CLAIM AMENDMENTS

1. **(Presently amended)** A method of inhibiting histone deacetylation activity in cells comprising contacting the cells with an effective amount of a compound of formula (I), thereby treating one or more disorders mediated by histone deacetylase; said compound having the following formula:



(I)

wherein

A is a cyclic moiety selected from the group consisting of C_{3-14} cycloalkyl, 3-14 membered heterocycloalkyl, C_{4-14} cycloalkenyl, 3-8 membered heterocycloalkenyl, aryl, or heteroaryl; the cyclic moiety being optionally substituted with alkyl, alkenyl, alkynyl, alkoxy, hydroxyl, hydroxylalkyl, halo, haloalkyl, amino, alkylcarbonyloxy, alkyloxycarbonyl, alkylcarbonyl, alkylsulfonylamino, aminosulfonyl, or alkylsulfonyl; or A is a saturated branched C_{3-12} hydrocarbon chain or an unsaturated branched C_{3-12} hydrocarbon chain optionally interrupted by -O-, -S-, -N(R^a)-, -C(O)-, -N(R^a)-SO_2-, -SO_2-N(R^a)-, -N(R^a)-C(O)-O-, -O-C(O)-N(R^a)-, -N(R^a)-C(O)-N(R^b)-, -O-C(O)-, -C(O)-O-, -O-SO_2-, -SO_2-O-, or -O-C(O)-O-, where each of R^a and R^b, independently, is hydrogen, alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, hydroxyl, or haloalkyl; each of the saturated and the unsaturated branched hydrocarbon chain being optionally substituted with alkyl, alkenyl, alkynyl, alkoxy, hydroxyl, hydroxylalkyl, halo, haloalkyl, amino, alkylcarbonyloxy, alkyloxycarbonyl, alkylcarbonyl, alkylsulfonylamino, aminosulfonyl, or alkylsulfonyl;

each of Y^1 and Y^2, independently, is -CH_2-, -O-, -S-, -N(R^c)-, -N(R^c)-C(O)-O-, -O-C(O)-N(R^c)-, -N(R^c)-C(O)-N(R^d)-, -O-C(O)-O-, or a bond; each of R^c and R^d, independently, being hydrogen, alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, hydroxyl, or haloalkyl;

L is a straight C_{2-12} hydrocarbon chain ~~optionally~~ containing at least one double bond, at least one triple bond, or at least one double bond and one triple bond; said hydrocarbon chain

being optionally substituted with C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxy, hydroxyl, halo, amino, nitro, cyano, C_{3-5} cycloalkyl, 3-5 membered heterocycloalkyl, monocyclic aryl, 5-6 membered heteroaryl, C_{1-4} alkylcarbonyloxy, C_{1-4} alkyloxycarbonyl, C_{1-4} alkylcarbonyl, or formyl; and further being optionally interrupted by -O-, -N(R^e)-, -N(R^e)-C(O)-O-, -O-C(O)-N(R^e)-, -N(R^e)-C(O)-N(R^f)-, or -O-C(O)-O-; each of R^e and R^f, independently, being hydrogen, alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, hydroxyl, or haloalkyl;

X^1 is O or S; and

X^2 is -OR^1, -SR^1, -NR^3-OR^1, -NR^3-SR^1, -C(O)-OR^1, -CHR^4-OR^1, -N=N-C(O)-$N(R^3)_2$, or -O-CHR^4-O-C(O)-R^5, where each of R^1 and R^2, independently, is hydrogen, alkyl, hydroxylalkyl, haloalkyl, or a hydroxyl protecting group; R^3 is hydrogen, alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, hydroxyl, haloalkyl, or an amino protecting group; R^4 is hydrogen, alkyl, hydroxylalkyl, or haloalkyl; R^5 is alkyl, hydroxylalkyl, or haloalkyl; and provided that when L is a C_{2-3} hydrocarbon containing no double bonds and X^2 is -OR^1, Y^1 is not a bond and Y^2 is not a bond;

or a salt thereof; and

determining whether the level of acetylated histones in the treated cells is higher than in untreated cells under the same conditions.

2. **(Original)** The method of claim 1, wherein X^1 is O.

3. **(Withdrawn)** The method of claim 1, wherein X^1 is S.

4. **(Original)** The method of claim 1, wherein X^2 is -OR^1, -NR^3-OR^1, -C(O)-OR^1, -CHR^4-OR^1, or -O-CHR^4-O-C(O)-R^5.

5. **(Original)** The method of claim 1, wherein X^2 is -OR^1, -NR^3-OR^1, -C(O)OR^1, or -O-CHR^4-O-C(O)-R^5.

6. **(Original)** The method of claim 1, wherein each of Y^1 and Y^2, independently, is -CH_2-, -O-, -N(R^c)-, or a bond.

7. **(Original)** The method of claim 1, wherein each of Y^1 and Y^2, independently, is $-CH_2-$ or a bond.

8. **(Canceled)**

9. **(Withdrawn)** The method of claim 8, wherein L is a C_{3-8} hydrocarbon chain substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

10. **(Original)** The method of claim 1, wherein L is an unsaturated hydrocarbon chain containing at least one double bond and no triple bond.

11. **(Withdrawn)** The method of claim 10, wherein L is an unsaturated C_{4-8} hydrocarbon chain substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

12. **(Original)** The method of claim 10, wherein the double bond is in trans configuration.

13. **(Withdrawn)** The method of claim 1, wherein L is an unsaturated hydrocarbon chain containing at least one double bond and one triple bond.

14. **(Withdrawn)** The method of claim 13, wherein L is an unsaturated C_{4-8} hydrocarbon chain substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

15. **(Withdrawn)** The method of claim 13, wherein the double bond is in trans configuration.

16. **(Withdrawn)** The method of claim 1, wherein A is a C_{5-8} cycloalkenyl or 5-8 membered heteroalkenyl containing at least one double bonds.

17. **(Original)** The method of claim 1, wherein A is phenyl, naphthyl, indanyl, or tetrahydronaphthyl.

18. **(Original)** The method of claim 1, wherein A is phenyl optionally substituted with alkyl alkenyl, alkynyl, alkoxy, hydroxyl, hydroxylalkyl, halo, haloalkyl, or amino.

19. **(Canceled)**

20. **(Canceled)**.

21. **(Withdrawn)** The method of claim 18, wherein L is an unsaturated C_{4-8} hydrocarbon chain containing at least one double bond and no triple bond, said unsaturated hydrocarbon chain optionally substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

22. **(Withdrawn)** The method of claim 21, wherein X^1 is O; X^2 is $-OR^1$, $-NR^3-OR^1$, $-C(O)OR^1$, or $-O-CHR^4-O-C(O)-R^5$; and each of Y^1 and Y^2, independently, is $-CH_2-$, $-O-$, $-N(R^c)-$, or a bond.

23. **(Withdrawn)** The method of claim 18, wherein L is an unsaturated hydrocarbon chain containing at least one double bond and one triple bond, optionally substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

24. **(Withdrawn)** The method of claim 23, wherein X^1 is O; X^2 is $-OR^1$, $-NR^3-OR^1$, $-C(O)OR^1$, or $-O-CHR^4-O-C(O)-R^5$; and each of Y^1 and Y^2, independently, is $-CH_2-$, $-O-$, $-N(R^c)-$, or a bond.

25. **(Canceled)**

26. **(Canceled)**

27. **(Canceled)**

28. **(Canceled)**

29. **(Canceled)**

30. **(Canceled)**.

31. **(Canceled)**

32. **(Withdrawn)** The method of claim 1, wherein A is an unsaturated branched C_{4-10} hydrocarbon chain optionally interrupted by $-N(R^a)-$, $-N(R^a)-C(O)-O-$, $-O-C(O)-N(R^a)-$, $-N(R^a)-C(O)-N(R^b)-$, $-O-C(O)-$, or $-C(O)-O-$ where each of R^a and R^b, independently, is hydrogen, alkyl, alkoxy, hydroxylalkyl, or hydroxyl.

33. **(Withdrawn)** The method of claim 32, wherein A contains only double bonds.

34. **(Withdrawn)** The method of claim 33, wherein L is a saturated C_{3-8} hydrocarbon chain optionally substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

35. **(Withdrawn)** The method of claim 34, wherein X^1 is O; X^2 is $-OR^1$, $-NR^3-OR^1$, $-C(O)OR^1$, or $-O-CHR^4-O-C(O)-R^5$; and each of Y^1 and Y^2, independently, is $-CH_2-$, $-O-$, $-N(R^c)-$, or a bond.

36. **(Withdrawn)** The method of claim 33, wherein L is an unsaturated C_{4-8} hydrocarbon chain containing only double bonds, said unsaturated hydrocarbon chain optionally being substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

37. **(Withdrawn)** The method of claim 36, wherein X^1 is O; X^2 is $-OR^1$, $-NR^3-OR^1$, $-C(O)OR^1$, or $-O-CHR^4-O-C(O)-R^5$; and each of Y^1 and Y^2, independently, is $-CH_2-$, $-O-$, $-N(R^c)-$, or a bond.

38. **(Withdrawn)** The method of claim 33, wherein L is an unsaturated C_{4-8} hydrocarbon chain containing at least one double bond and one triple bond, said unsaturated hydrocarbon chain optionally being substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

39. **(Withdrawn)** The method of claim 38, wherein X^1 is O; X^2 is $-OR^1$, $-NR^3-OR^1$, $-C(O)OR^1$, or $-O-CHR^4-O-C(O)-R^5$; and each of Y^1 and Y^2, independently, is $-CH_2-$, -O-, $-N(R^c)-$, or a bond.

40. **(Currently Amended)**The method of claim 1, wherein said compound is 5-phenyl-2,4-pentadienoic acid, 3-methyl-5-phenyl-2,4-pentadienoic acid, 4-methyl-5-phenyl-2,4-pentadienoic acid, 4-chloro-5-phenyl-2,4-pentadienoic acid, 5-(4-dimethylaminophenyl)-2,4-pentadienoic acid, 5-(2-furyl)-2,4-pentadienoic acid, 5-phenyl-2-en-4-yn-pentanoic acid, 6-phenyl-3,5-hexadienoic acid, 7-phenyl-2,4,6-heptatrienoic acid, 8-phenyl-3,5,7-octatrienoic acid, ~~potassium 2-oxo-6-phenyl-3,5-hexadienoate, potassium 2-oxo-8-phenyl-3,5,7-octatrienoate,~~ cinnamoylhydroxamic acid, methyl-cinnamoylhydroxamic acid, 4-cyclohexanebutyroylhydroxamic acid, benzylthioglycoloylhydroxamic acid, 5-phenylpentanoylhydroxamic acid, 5-phenyl-2,4-pentadienoylhydroxamic acid, N-methyl-5-phenyl-2,4-pentadienoylhydroxamic acid, 3-methyl-5-phenyl-2,4-pentadienoylhydroxamic acid, 4-methyl-5-phenyl-2,4-pentadienoyl hydroxamic acid, 4-chloro-5-phenyl-2,4-pentadienoylhydroxamic acid, 5-(4-dimethylaminophenyl)-2,4-pentadienoylhydroxamic acid, 5-phenyl-2-en-4-yn-pentanoylhydroxamic acid, 5-(2-furyl)-2,4-pentadienoylhydroxamic acid, 6-phenylhexanoylhydroxamic acid, 6-phenyl-3,5-hexadienoylhydroxamic acid, N-methyl-6-phenyl-3,5-hexadienoylhydroxamic acid, 7-phenylheptanoylhydroxamic acid, 7-phenyl-2,4,6-hepta-trienoylhydroxamic acid or 8-phenyloctanoylhydroxamic acid.

41. **(Currently Amended)** The method of claim 1, wherein said compound is 5-phenyl-2,4-pentadienoic acid, 8-phenyl-3,5,7-octatrienoic acid, ~~potassium 2-oxo-8-phenyl-3,5,7-octatrienoate~~, benzylthioglycoloylhydroxamic acid, 5-phenyl-2,4-pentadienoylhydroxamic acid, 6-phenylhexanoylhydroxamic acid, 7-phenyl-2,4,6-hepta-trienoylhydroxamic acid, or 8-phenyloctanoylhydroxamic acid.

42. **(Original)** The method of claim 1, wherein the cells are treated with a compound of formula (I) in vivo.

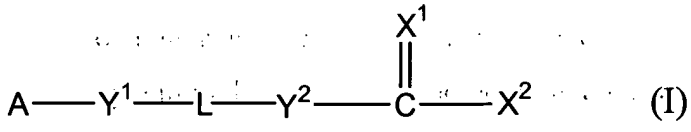
43. **(Original)** The method of claim 1, wherein the cells are treated with a compound of formula (I) in vitro.

44. **(Original)** The method of claim 1, wherein the cells being treated are cancerous.

45. **(Original)** The method of claim 1, wherein the disorder is selected from the group consisting of cancer, hemoglobinopathies, thalassemia, sickle cell anemia, cystic fibrosis, protozoan infection, adrenoleukodystrophy, alpha-1 anti-trypsin, retrovirus gene vector reactivation, wound healing, hair growth, peroxisome biogenesis disorder, and adrenoleukodystrophy.

46. **(Original)** The method of claim 1, wherein the disorder is cancer, cystic fibrosis, or adrenoleukodystrophy.

47. **(Withdrawn)** A method of inhibiting histone deacetylase in cells comprising contacting the cells with an effective amount of a compound of formula (I):



(I)

wherein

A is phenyl optionally substituted with alkyl alkenyl, alkynyl, alkoxy, hydroxyl, hydroxylalkyl, halo, haloalkyl, or amino;

each of Y^1 and Y^2, independently, is $-CH_2-$, -O-, -S-, $-N(R^c)-$, or a bond; where R^c is hydrogen, alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, hydroxyl, or haloalkyl;

L is a straight C_{2-12} hydrocarbon chain optionally containing at least one double bond, at least one triple bond, or at least one double bond and one triple bond; said hydrocarbon chain being optionally substituted with C_{1-4} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, C_{1-4} alkoxy, hydroxyl, halo, amino, nitro, cyano, C_{3-5} cycloalkyl, 3-5 membered heterocycloalkyl, monocyclic aryl, 5-6 membered heteroaryl, C_{1-4} alkylcarbonyloxy, C_{1-4} alkyloxycarbonyl, C_{1-4} alkylcarbonyl, or formyl; and further being optionally interrupted by -O-, $-N(R^e)-$, $-N(R^e)-C(O)-O-$, $-O-C(O)-N(R^e)-$, $-N(R^e)-C(O)-N(R^f)-$, or $-O-C(O)-O-$; each of R^e and R^f, independently, being hydrogen, alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, hydroxyl, or haloalkyl;

X^1 is O or S; and

X^2 is $-OR^1$, $-SR^1$, $-NR^3-OR^1$, $-NR^3-SR^1$, $-C(O)-OR^1$, $-CHR^4-OR^1$, $-N=N-C(O)-N(R^3)_2$, or $-O-CHR^4-O-C(O)-R^5$; where each of R^1 and R^2, independently, is hydrogen, alkyl, hydroxylalkyl, haloalkyl, or a hydroxyl protecting group; R^3 is hydrogen, alkyl, alkenyl, alkynyl, alkoxy, hydroxylalkyl, hydroxyl, haloalkyl, or an amino protecting group; R^4 is hydrogen, alkyl, hydroxylalkyl, or haloalkyl; R^5 is alkyl, hydroxylalkyl, or haloalkyl; and provided that when L is a C_{2-3} hydrocarbon containing no double bonds and X^2 is $-OR^1$, Y^1 is not a bond and Y^2 is not a bond;

or a salt thereof; and

determining whether the level of acetylated histones in the treated cells is higher than in untreated cells under the same conditions.

48. **(Withdrawn)** The method of claim 47, wherein L is a saturated C_{3-8} hydrocarbon chain substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

49. **(Withdrawn)** The method of claim 48, wherein X^1 is O; X^2 is $-OR^1$, $-NR^3-OR^1$, $-C(O)OR^1$, or $-O-CHR^4-O-C(O)-R^5$; and each of Y^1 and Y^2, independently, is $-CH_2-$, $-O-$, $-N(R^a)-$, or a bond.

50. **(Withdrawn)** The method of claim 47, wherein L is an unsaturated C_{4-8} hydrocarbon chain containing only double bonds, said unsaturated hydrocarbon chain optionally substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

51. **(Withdrawn)** The method of claim 50, wherein X^1 is O; X^2 is $-OR^1$, $-NR^3-OR^1$, $-C(O)OR^1$, or $-O-CHR^4-O-C(O)-R^5$; and each of Y^1 and Y^2, independently, is $-CH_2-$, $-O-$, $-N(R^c)-$, or a bond.

52. **(Withdrawn)** The method of claim 47, wherein L is an unsaturated hydrocarbon chain containing at least one double bond and one triple bond, optionally substituted with C_{1-2} alkyl, C_{1-2} alkoxy, hydroxyl, $-NH_2$, $-NH(C_{1-2}$ alkyl), or $-N(C_{1-2}$ alkyl$)_2$.

53. **(Withdrawn)** The method of claim 53, wherein X^1 is O; X^2 is $-OR^1$, $-NR^3-OR^1$, $-C(O)OR^1$, or $-O-CHR^4-O-C(O)-R^5$; and each of Y^1 and Y^2, independently, is $-CH_2-$, $-O-$, $-N(R^c)-$, or a bond.

Claims 54-66 **(Canceled)**